



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/637,047	08/11/2000	Fan Zhou	FORE-74	7203

7590 06/01/2005

Ansel M. Schwartz  
One Sterling Plaza  
Suite 304  
201 N. Craig Street  
Pittsburgh, PA 15213

EXAMINER

MOORE, IAN N

ART UNIT	PAPER NUMBER
----------	--------------

2661

DATE MAILED: 06/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/637,047	ZHOU ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Ian N. Moore	2661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 09 March 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,3-14 and 16-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-14 and 16-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Response to Amendment*

1. Claim objection, on claim 1 is withdrawn since it is being amended accordingly.
2. Claim rejection under 35 USC § 112 second paragraph, on claims 9-13 and 18-24 are withdrawn since they are being amended accordingly.
3. Claims 1 and 14 are amended.
4. Claims 1,3-14,16-24 are rejected by the new ground(s) of rejection necessitated by the amendment.

### *Claim Rejections - 35 USC § 103*

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 1,3,4,14,16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sindhu (U.S. 5,905,725) in view of Manning (US 5,909,427).

**Regarding Claim 1**, Sindhu discloses a switch for switching packets (see FIG. 2B, Router 20) from a plurality of sources (see FIG. 2B and 3, Input ports 107; see col. 4, lines 16-20, 24-25,28-30) comprising:

a port card (see FIG. 2B, a combined system of input port 107 and output port 108) having a striper (see FIG. 3, Data Handler 304 of input port 107);

Art Unit: 2661

a fabric (see FIG. 2B, a combined system of input switch 100, memory 104, controller 106, and output switch 102 are a fabric of the router 100; see col. 4, lines 20-30), the striper sending portions of the packet as striper to the fabric (see col. 6, lines 57-65; Data Handler 302 of the multiport divides the packets received onto fixed length cells and send to the input switch A1), the fabric having

a memory (see FIG. 2B and 5B, Memory 104) in which portion of the packet (see col. 4, lines 53-60; fixed length cells 454,456) are stored (see col. 4, lines 31-34); and

a transferring mechanism (see FIG. 2B and 5B, Input Switch 100) which transfers a predetermined portions of a packet (see FIG. 5B, fixed length cell 454, 456; see col. 4, lines 53-60) to the to the memory as the predetermined portions are received (see FIG. 5B, fixed size cell 450, 452) transferring predetermined portions of the packet as fixed length segments as the fixed length segments are received (see FIG. 3, Data handler 304 of Input port 107 segments the packet into fixed sized cell, thus input switch 100 received fixed length cell; see col. 4, lines 52-64) followed by a single final segment of any length (see col. 7, lines 53-54; arbitrary length) less than or equal to the length of the fixed length segments (see col. 7, lines 50-55; note that the last cell is arbitrary length of less than or equal to the fixed sized cell length since the packet is divided into fixed length) wherein the packet is transferred to the memory (see FIG. 5B, series of cells 454,456 toward memory 104) to smooth out bursts caused by lengthy packets (see col. 2, lines 14-35).

Sindhu does not explicitly disclose a plurality of fabrics. However, the use of more than one fabrics is well known in the art. In particular, Manning teaches a plurality of fabrics (see FIG. 1, switch control module foreground 10 and background 12, or see FIG. 2, foreground and background switch fabrics; see col. 2, lines 49-65; see col. 5, lines 35-65). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide plurality of fabrics, as taught by Manning in the system of Sindhu, so that it would provide redundant switch system which substantially eliminate to reduce the disadvantages and problems associated with increasing the availability and reliability; see Manning col. 1, line 45-60.

**Regarding claim 3**, Sindhu discloses the transferring mechanism transfers fixed length segment of different packets (see FIG. 5B, different fixed sized cells, 454,456) interleaved among each other as they are received to the memory (see FIG. 5A, Round robin data handler 500 and output processor 505; note that the cells from each incoming port are multiplexed, by utilizing time division multiplexing scheme, and then sending them to the memory. Thus, the "interleaving" process is the "time division multiplexing" process; see col. 6, lines 1-14).

**Regarding claim 4**, Sindhu discloses the transferring mechanism (see FIG. 5B, Input Switch 100) includes an aggregator (see FIG. 5B, Round Robin Data Handler 500; see col. 6, lines 1-14) which receives portions of packets (see FIG. 5B, fixed length cells 450,452) from the plurality of sources (see FIG. 5B, B0-B7;

Art Unit: 2661

sources stations which connect to Input ports 107; see col. 4, lines 16-20, 24-25, 28-30).

**Regarding Claim 14**, the method claim, which has substantially all the limitations of the respective switch claim 1. Therefore, it is subjected to the same rejection.

**Regarding Claim 16**, the method claim, which has substantially all the limitations of the respective switch claim 3. Therefore, it is subjected to the same rejection.

**Regarding claim 17**, Sindhu discloses receiving portions of packets (see FIG. 5B, fixed length cells 450, 452) from the different sources (see FIG. 5B, B0-B7; sources stations which connect to Input ports 107; see col. 4, lines 16-20, 24-25, 28-30) at an aggregator (see FIG. 5B, Round Robin Data Handler 500; see col. 6, lines 1-14) of the transferring mechanism disposed in a fabric of the switch (see FIG. 2B, a combined system of input switch 100, memory 104, controller 106, and output switch 102 are a fabric of the router 100; see col. 4, lines 20-30).

7. Claims 5-8 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sindhu.

**Regarding claim 5**, Sindhu discloses a memory (see FIG. 2B, Memory 104) and memory controller (see FIG. 2B, controller 106) for storing and controlling processes. Sindhu does not explicitly disclose a memory includes a memory controller. Incorporating a memory controller within a memory does not define a

patentable distinct invention over that in the system of Sindhu since the invention as a whole and the system of Sindhu are directed to storing data/cells in the memory. The degree in which a memory includes a memory controller presents no new or unexpected results, so long as the data/cells are stored in the memory, and the data/cells is processed in a successful way. Therefore, to have a memory includes a memory controller to store data/cell would have been routine experimentation and optimization in the absence of criticality.

**Regarding claim 6**, Sindhu discloses wherein the aggregator uses TDM to multiplex segments of packets from different sources to the memory controller (see col. 2, lines 30-42; see col. 6, lines 1-14).

**Regarding claim 7**, Sindhu discloses placing an identifier (see FIG. 6, a data structure of Key 602, full address 604, and offset 606) with each segment identifying from which source (see FIG. 2A, a packet from Input port 107) the segments came from (see col. 6, lines 26-40; see col. 4, lines 36-39).

**Regarding claim 8**, Sindhu discloses wherein memory controller includes per source queues (see FIG. 11A, Memory banks 105), and stores each segment in a corresponding per source queue based on the identifier of the source (see col. 6, lines 32-65; see col. 9, lines 18-44).

**Regarding Claim 18**, the method claim, which has substantially all the limitations of the respective switch claim 6. Therefore, it is subjected to the same rejection.

**Regarding Claim 19**, the method claim, which has substantially all the limitations of the respective switch claim 7. Therefore, it is subjected to the same rejection.

**Regarding Claim 20**, the method claim, which has substantially all the limitations of the respective switch claim 8. Therefore, it is subjected to the same rejection.

8. Claims 9-13 and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sindhu in view of Manning, as described above, and further in view of Petersen (U.S. 5,822,321).

**Regarding Claim 9**, the combined system of Sindhu and Manning discloses all of the limitations as recited in claims 1-8 and 14-20 above. Manning teaches per destination queues (see FIG. 1, output buffers of FSPP 30 in I/O modules 1-n), and the packet are changed from a per source queue (see FIG. 1, input buffers of TSPP 28 in I/O modules 1-n) to a corresponding per destination queue (see FIG. 1, output buffers of FSPP 30 in I/O modules 1-n; see col. 3, lines 60 to col. 4, lines 12).

Neither Sindhu nor Manning explicitly discloses once all segments for a packet are received, all the segments of the packet are changed to a corresponding queue. Petersen discloses that once all segments for a packet are received, all the segments of the packet are changed to a corresponding per destination queue (see Fig. 12, FIFO-OUT 1208 and Connection table 1207; and col. 8, line 1-15; note that once all the segments (i.e. first, middle, and last segment) arrive, SAR fully



reassemble the user packet and transmitted to FIFO-OUT.) Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide sending/changing fixed sized cells to the FIFO once all fixed sized cells of the variable size packet are received, as taught by Petersen in the combined system of Sindhu and Manning, so that it would effectively utilizes available bandwidth and avoids the problems associated with switching excessively large cells from one stream to another by complete segmenting and reassembling; see Petersen col. 2, line 15-46.

**Regarding claim 10**, the combined system of Sindhu, Manning, and Petersen discloses all limitations described above in Claims 1-9.

Petersen discloses acceptance criteria for accepting segments (see Fig. 6, step 608 "threshold" and step 610 "time-out"), and if the segment is not accepted, then all previously received segments associated with the segment not accepted are purged and any segments associated with the segment not accepted that are received after the segment that was not accepted was received, are ignored (see Fig. 6, Reassembly state 602 for utilizing threshold and time-out for detecting error, and Abort State 603 for discarding the cells after detecting error; also see col. 5, line 1-40; note that during the reassembly process, the reconstruction of the user packet begins only after receiving the last segment. If the last segment is not received during a threshold period, a time-out occurs. Then the process is in the abort mode by halting reassembly process and return to idle mode. At the Idle mode, the process must begin reassembling from the first segment. Thus, all invalid segment

Art Unit: 2661

segments receive during the abort mode are discarded since the process is now returning back to the idle mode.)

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Sindhu, Manning, and Petersen, as taught by Petersen, for the same reason stated in Claims 9 and 21 above.

**Regarding claims 11**, Sindhu disclose a separator (see FIG. 2B, output switch 102) disposed in the fabric connected to the aggregator (see col. 4, lines 20-30).

**Regarding claim 12**, Sindhu discloses the port card (see FIG. 2B, a combined system of input port 107 and output port 108) includes an unstriper (see FIG. 17, Output formatter 1714 of output port 108; see col. 11, lines 62 to col. 12, lines 6) which receives portions of packets from the separator (see FIG. 15, output switch 102; note that output formatter receives fixed length cells from output switch and reassemble back into a variable length packet; see col. 10see col. 22-47; see col. 11, lines 62 to col. 12, lines 6).

**Regarding claim 13**, the combined system of Sindhu, Manning and Petersen discloses the memory controller includes a memory as described above in claims 1-12. Sindhu discloses a shared memory (see FIG. 2B, memory 104), and the source queues (see FIG. 2B, memory banks 105) are part of the shared memory. Manning discloses the destination queues (see FIG. 1, output buffers of FSPP 30 in I/O modules 1-n) and the source queues (see FIG. 1, input buffers of

TSPP 28 in I/O modules 1-n) are part of a shared memory (see FIG. 1, cell flow processor includes input and output buffers, thus it is a shared memory).

**Regarding Claim 21**, the method claim, which has substantially all the limitations of the respective switch claim 9. Therefore, it is subjected to the same rejection.

**Regarding Claim 22**, the method claim, which has substantially all the limitations of the respective switch claim 10. Therefore, it is subjected to the same rejection.

**Regarding claim 23**, Sindhu discloses the step of receiving portions of packets as stripes from different sources at the aggregator of the transferring mechanism (see FIG. 5B, fixed length cells 450 and 452 are receives at input switch 100) disposed in the fabric of the switch from a striper (see FIG. 3, Data Handler 304 of output port 108) of the port card (see FIG. 2B, a combined system of input port 107 and output port 108) of the switch (see col. 5, lines 55-66). Manning discloses the plurality of fabrics as recited above. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Sindhu, as taught by Manning, for the same reason stated in Claim 14 above.

**Regarding claim 24**, Sindhu discloses sending portions of the packet from the memory controller (see FIG. 2B, memory 104 and controller 106) with a separator of the fabric (see FIG. 15, output switch 102) to an unstriper of the port card (see FIG. 17, Output formatter 1714 of output port 108; see col. 11, lines 62 to

Art Unit: 2661

col. 12, lines 6). Manning discloses the plurality of fabrics as recited above.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Sindhu, as taught by Manning, for the same reason stated in Claim 14 above.

### ***Response to Arguments***

9. Applicant's arguments with respect to claim 1,3-14, and 16-24 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Art Unit: 2661

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ian N. Moore whose telephone number is 571-272-3085. The examiner can normally be reached on M-F: 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau T. Nguyen can be reached on 571-272-3126. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

INM

*INM*

5/27/05

*Bob A. Phunkulh*  
**BOB PHUNKULH**  
**PRIMARY EXAMINER**